

CLAIMS (once amended)

1. Casting procedure for obtaining parts provided with inside cavities or holes, wherein said holes and/or cavities are obtained by laying into a mould or chill intended to receive the molten metal one or more cores made of sand or other material, and wherein each core is realised separately into a proper core box, characterised in that and wherein before laying into the mould or chill, it provides for the step of coating at least one core with a layer of a material adapted to dissolve in contact with the casting metal, characterized in that, before said step of coating at least one core with a layer of a material adapted to dissolve in contact with the casting metal, it comprises the step of laying at least a valve seat (14, 15) for the intake and/or exhaust valve in a die (19) for coating at least one core with a layer of a material adapted to dissolve in contact with the casting metal embedding said valve seat.

2. Casting procedure according to claim 1, wherein, before said step of coating at least one core with a layer of a material adapted to dissolve in contact with the casting metal, it comprises the step of realizing at least a seat (16', 17') for a valve guide (16'', 17'').

23. Casting procedure according to claim 1 or 2, wherein said coating is applied to the core only in the

zones and by the thickness of the casting shape.

34. Casting procedure according to claim 23, wherein the coating is performed by injection molding on the core to be coated.

5 5. Casting procedure of an engine cylinder head according to anyone of the previous claims, wherein a main core (11), which is the water jacket core intended to realize the coolant circulation passages, and secondary cores, which mainly are ducts cores (12, 13) 10 for the intake and exhaust ducts, are provided.

46. Casting procedure according to claim 2 or 3 5, wherein a the main core is used,—realised into a special core box, along with one or more secondary cores intended to be associated to said main core, characterised in that 15 it comprises the following steps:

- coating at least one secondary core, only in the zones and by the shaped thickness, with a layer of material intended to dissolve in contact with the molten metal;
- 20 - inserting the group consisting of at least one secondary core and of at least a valve seat, all coated with said layer of material intended to dissolve in contact with the molten metal pre-coated secondary cores into the main core box yet to be moulded;
- 25 - moulding the main core box; and

- inserting the monolithic group comprising the water jacket core (11), the secondary cores, the at least one valve seat, the layer of material intended to dissolve in contact with the molten metal obtained at the previous step, consisting of the main core, of the secondary cores and of the coating material that keeps them firmly connected, into the mould or chill intended to receive the molten metal.

7 5. Chill casting procedure of an engine cylinder head according to claim 6 4, wherein the main core is that intended to realise the waterjacket (11) for the engine coolant circulation, and wherein the secondary cores comprise at least the cores of the intake and exhaust ducts (12, 13), characterised in that said duct cores are laid into a single die (19) to be coated with the coating material layer (18) so as to form a single body to be laid into the special water jacket core box.

8 6. Casting procedure according to claim 7 5, wherein valve seats (14, 15) for the intake and exhaust ducts are first laid into the die, and the injected material enveloping said valve seats on the outer diameter.

9 7. Casting procedure according to anyone of the previous claims claim 5 or 6, wherein prior to assembly 25 monolithic group into the mould or chill, at least a the

valve guides (18", 17") for the intake and/or exhaust valves is are inserted into the monolithic group comprising the main core and the secondary coated cores.

10 8. Casting procedure according to any one of the previous claims, wherein the cores to be coated consist of hollow inserts (23) made of a heat resistant material, wherein the cavity represents the shape according to the drawing.

11 9. Casting procedure according to any one of the previous claims, wherein the cores to be coated consist of a hollow insert for the shaped zones only, made of a heat resistant material filled with sand and polymerised resin to realise the prints and prevent metal infiltrations.

15 12 10. Casting procedure according to any one of the previous claims, wherein the coating material of the sand and polymerised resin cores or of the inserts is a foamed material, such as polystyrene.

13 11. Main core box for the casting procedure according to any one of claims 5-12 4-10, characterised in that it only consists of two portions intended to be closed onto one another, thereby in that it is free from undercuts and therefore of mobile parts adapted to perform the draft, and in that it exhibits seats and negative prints (20', 20") for receiving and blocking

into position the secondary cores pre-coated with the coating material.

14 12. Die for coating the intake and exhaust duct cores in an engine cylinder head casting process according to any one of claims 5-12 10, characterised in that it is provided with cylindrical mobile pins (16, 17) intended to realise at least a seats (16', 17') into the coating material for the valve guides (16'', 17'') of the intake and/or exhaust valves.

10 15 13. Die for coating the intake and exhaust duct cores (12,13) in an engine cylinder head casting process according to any one of claims 5-12 10, characterised in that it is configured for receiving at least a valve seats (14, 15) for the intake and/or exhaust valves.

15 16 14. Engine cylinder head characterised in that it embeds at least one hollow insert (23) made of metal or other heat resistant material, whose interior forms the design of the corresponding intake and exhaust duct.

17 engine cylinder head casting, characterized in that of embedding at least a valve seat.

18 engine cylinder head casting, characterized in that of embedding at least a valve guide.

19. Casting procedure for obtaining parts provided with inside cavities or holes, wherein said holes and/or cavities are obtained by laying into a mould or chill

intended to receive the molten metal one or more cores made of sand or other material, wherein each core is realised separately into a proper core box, and wherein before laying into the mould or chill, it provides for
5 the step of coating at least one core with a layer of a material adapted to dissolve in contact with the casting metal, characterized in that, before said step of coating at least one core with a layer of a material adapted to dissolve in contact with the casting metal, it comprises
10 the step of realizing at least a seat (16', 17') for a valve guide (16", 17").

20. Casting procedure of an engine cylinder head, wherein said cylinder head presents at least a water jacket for the engine coolant circulation, at least a
15 intake and/or exhaust duct, at least a valve seat for the intake and/or exhaust valve, wherein said water jacket and duct are obtained by laying into a mould or chill intended to receive the molten metal one or more cores made of sand or other material and realized separately
20 into proper core boxes, and wherein at least the core of the duct is coated with a layer of a material adapted to dissolve in contact with the casting metal before being laid into the mould or chill, characterized in that it comprises the step of embedding said at least valve seat
25 into said layer of a material adapted to dissolve in

contact with the casting metal, in such a way that during the casting, the molten metal will dissolve and replace the layer of a material adapted to dissolve in contact with the casting metal, determining the required thickness and embedding said valve seat.

21. Casting procedure of an engine cylinder head, wherein said cylinder head presents at least a water jacket for the engine coolant circulation, at least a intake and/or exhaust duct, at least a valve guide for the intake and/or exhaust valve, wherein said water jacket and duct are obtained by laying into a mould or chill intended to receive the molten metal one or more cores made of sand or other material and realized separately into proper core boxes, and wherein at least the core of the duct is coated with a layer of a material adapted to dissolve in contact with the casting metal before being laid into the mould or chill, characterized in that it comprises the step of embedding said at least valve guide into said layer of a material adapted to dissolve in contact with the casting metal, in such a way that during the casting, the molten metal will dissolve and replace the layer of a material adapted to dissolve in contact with the casting metal, determining the required thickness and embedding said valve guide.

22. Casting equipment of an engine cylinder head,

wherein said cylinder head presents at least a intake and/or exhaust duct, at least a valve seat for the intake and/or exhaust valve, wherein said duct is obtained with one or more cores made of sand or other material, and
5 wherein at least the core of the duct is coated with a layer of a material adapted to dissolve in contact with the casting metal, characterized in that it provides for embedding said at least valve seat into said layer of a material adapted to dissolve in contact with the casting metal, in such a way that during the casting, the molten metal will dissolve and replace the layer of a material adapted to dissolve in contact with the casting metal, determining the required thickness and embedding said valve seat.

15 23. Casting equipment of an engine cylinder head, wherein said cylinder head presents at least a intake and/or exhaust duct, at least a valve guide for the intake and/or exhaust valve, wherein said duct is obtained with one or more cores made of sand or other material, and wherein at least the core of the duct is coated with a layer of a material adapted to dissolve in contact with the casting metal, characterized in that it provides for embedding said at least valve guide into said layer of a material adapted to dissolve in contact
20 with the casting metal, in such a way that during the
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casting, the molten metal will dissolve and replace the layer of a material adapted to dissolve in contact with the casting metal, determining the required thickness and embedding said valve guide.

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